HEALTHY COASTAL ECOSYSTEMS FOCUS TEAM

ENDANGERED SPECIES IMPACTS

OCTOBER 2009

110 ALASKA: Sea Grant-NOAA research studied the ecological role of marine mammals and their response to a changing environment

Activity Summary: Alaska Sea Grant supported MAP's marine mammal specialist while collaborating on the Gulf Apex Predator-prey project, a NOAA-funded study of the seasonal and interannual variability in prey availability and use by Kodiak's apex marine predators. Results showed that the diets and distribution of Kodiak's endangered marine mammals are diverse and flexible, responding to temporal changes in environmental conditions and local prey availability. Impact Statement: Ecosystem-based marine resource management relies on understanding both the structural components of the system and the functional mechanisms of their interactions. By monitoring the seasonal distribution and abundance of predators and their prey, GAP studies have illuminated how changes in coastal climate and commercial harvests may affect endangered marine mammals and other apex predators in Alaskan waters. As a multi-year study, GAP is developing the time-series needed to explore and anticipate effects of environmental change on primary and secondary production in a coastal marine ecosystem. *[(ebm mod cli end)]*

1109 ALASKA: Alaska Sea Grant improved marine mammal research through killer whale tracking

Activity Summary: Researchers in this project (RR/06-10) used acoustics to continuously monitor killer whale visitation and feeding behavior at a predation hot spot in the Bering Sea—the northern fur seal rookeries at the Pribilof Island of St. Paul. Impact Statement: Program Level Impact: Alaska Sea Grant places a high priority on developing cost-effective and innovative techniques to discover knowledge that can benefit marine resource management. This project proved the use of passive acoustic recording as a management tool to monitor killer whale activity near fur seal rookeries. Project Level Impact: This was the first comprehensive acoustic assessment of killer whale predation and visitation patterns near rookeries. The study demonstrated that passive acoustics are an effective technique that offers several advantages over traditional boat-based approaches to studying these elusive predators; mainly that observations are made continuously day and night and in inclement weather that would otherwise preclude killer whale detection though visual observation alone. This project spurred the North Pacific Universities Marine Mammal Research Consortium and the Alaska SeaLife Center to provide $124,000 to expanded acoustic studies of killer whales at the Pribilofs during 2008. Finally, in combination with the UAF International Polar Year Office, this study has become a project that engages the help of community members to monitor their environment for killer whales. *[M/180-01 (mon end)]*

1127 CALIFORNIA: Assessing Withering Syndrome Resistance in California Black Abalone

This project has revealed four very important facts: 1: Black abalone are recruiting to San Nicolas Island. 2: These progeny are more resistant to intracellular bacterial disease than are those from Northern California, where populations have not suffered great losses due to withering syndrome. 3: We have insight into the mechanism of resistance (lack of digestive gland metaplasia). 4: We have discovered a new bacterial parasite in California abalone that is in need of evaluation for its identity and pathogenic potential for successful management of abalone resources. The NOAA protected resources division has discussed some of our findings regarding the listing of black abalone as an endangered species. Contact Glenn Vanblaricom (co-PI on project) or Melissa Neuman (Melissa.Neuman@noaa.gov) for details. 07.15.08 The primary impact of this project is the development of molecular tools that can be used to better understand the mechanisms of immune function in abalone. Specifically, gene expression

analysis can continue to be used to assess differences in populations that translate into improved performance in the face of disease. These tool will are valuable from both a commercial aquaculture perspective as well as for conservation efforts where identifying superior broodstock is advantageous. Gene sequences and related information is deposited in NCBI's GenBank Database where it is freely accessible by the public. Links to these and other data is also available @ http://fish.washington.edu/research/genefish/robertslab/abalone.html. *[R/ENV-129PD (dis end)]*

1132 CALIFORNIA: California Beach Health

This project has already had important impacts for habitat monitoring on sandy beaches and for the involvement of a variety of stakeholders in management practices. The California Grunion is now considered a Species of Special Concern and the sandy beach is considered Essential Fish Habitat according to the Magnussen-Stevens Act, as interpreted by the National Marine Fisheries Service and the California Department of Fish and Game. Citizen scientists from coastal California have been trained and have provided extensive data for an understudied species, and their commitment has extended beyond this one species to a sense of stewardship for the coastal habitat. The National Marine Fisheries Service- Southwest Region, Habitat Conservation Division has funded Grunion Greeter monitoring efforts in 2008 and plans to continue the work in future years. New management practices are in place throughout the habitat range of the grunion as a result of this work. The PI has evaluated habitat concerns for numerous agencies including California Coastal Commission, National Marine Fisheries Service, California Department of Fish and Game, Los Angeles Beaches and Harbors, California State Parks, the Goleta Beach restoration for the County of Santa Barbara, and ocean outlets in the County of Orange. The data were used in the assessment of the effects of the Cosco Busan fuel spill in San Francisco Bay. Numerous environmental organizations including Surfrider Foundation, Heal The Bay – Santa Monica, Santa Barbara Channel Keepers, and the Audubon Society are involved in grunion studies. Aquariums including Cabrillo Marine Aquarium, Birch Aquarium at Scripps Institution of Oceanography, the Roundhouse Aquarium in Manhattan Beach, the Aquarium of the Pacific in Long Beach, and the Ty Warner Sea Center of the Santa Barbara Museum of Natural History have grunion displays and programs as part of their mission. Several State Parks have initiated new public programs for grunion runs at their sites, including San Elijo State Beach, Bolsa Chica State Beach, Doheny State Beach, and Crystal Cove State Beach. Based on the efforts of the Working Group for beach managers and field operators, we are initiating the formation of a nonprofit organization. The focus will be to develop and disseminate best practices for beach management to balance wildlife conservation and recreation. *[R/CZ-195 (mon end train)]*

693 CONNECTICUT: Sea Grant Informs Management by Documenting Effect of Oyster Depuration Gear on Eelgrass

The results of a Connecticut Sea Grant extension study of the effects of oyster depuration gear on eelgrass enabled researchers, extension specialists, and resource managers to place the potential impacts from aquaculture in perspective with other anthropogenic impact by providing critical information that was used in the eelgrass management plan for Connecticut issued in July 2007, and assisted managers in balancing the needs of economic development with sustainable use of existing resources. This critical information is being used in the decision-making process for aquaculture applications by the Connecticut Department of Agriculture, Bureau of Aquaculture, Connecticut

Department of Environmental Protection and US Army Corps of Engineers-New England District. USDA Natural Resources Conservation Service has partnered with Sea Grant to develop best management practices for the industry and is developing an incentive plan to help conserve threatened marine resources. *[A/E-1 (end)]*

1074 HAWAII: UH Sea Grant Pioneers Research Crucial to Sustaining Coral Reefs

In collaboration with other researchers and funding support, we have pioneered the field of investigation into free-living Symbiodinium, the dinoflagellate genus that is crucial to sustaining coral reefs in Hawaii and elsewhere. These free-living sources of Symbiodinium may be pivotal in recovery of coral reefs that force the symbiotic populations to be replenished as reefs evolutionarily and physiologically adapt with climate changes. *[R/CR-16 (end ebm)]*

409 MISSISSIPPI/ALABAMA: Sea Grant Nature Tourism Initiative teaches dolphin cruise operators sustainable viewing practices

Dolphin viewing tours on Alabamaâ€™s Gulf Coast are the largest sector of the nature tourism industry in Baldwin and Mobile County. Approximately 100,000 tourists pay for these excursions annually. The Nature Tourism Initiative, in partnership with NOAAâ€™s Office of National Marine Sanctuaries and NMFS, the Whale and Dolphin Conservation Society and the Dolphin Ecology Project trained 21 dolphin tour operators to promote responsible stewardship of wild dolphins in coastal waterways through the Dolphin SMART program. One recognized Dolphin SMART tour operator has reported teaching 15,000 Gulf Coast tourists sustainable viewing practices. *[A/O-1 (end train)]*

10 WASHINGTON: Sea Grant Assesses the Effect of Ambient Noise on Killer Whales in Puget Sound

The ambient noise levels in Puget Sound have grown over the past 150 years due to population growth and anthropogenic activity. Sea Grant research is assessing instrumentation to characterize underwater ambient noise, focusing on the acoustic environment to which marine mammals (and particularly, Southern resident killer whales) are exposed. Data will be used to assess noise contributions associated with maritime activities such as shipping and recreational boating. Impact: The results will contribute to better understanding of the acoustic ecology of Puget Sound, with implications for marine operations, ecosystem management and development of observing systems. *[R/Ac-15 (end)]*

11 WASHINGTON: Sea Grant assesses the effect of ambient noise on killer whales in Puget Sound

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from passing aircraft is an interesting effect that has a theoretical basis but is rarely seen in data and may launch further studies to more completely characterize its impact. *[R/Ac-15 (end)]*

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1649 WASHINGTON: Sea Grant Works with Regional and International Fisheries to Reduce Seabird Deaths

Sea Grant is continuing work with fishermen and federal managers to curb accidental capture of endangered short-tailed albatross and other seabirds in commercial fishing operations. Based on Sea Grant recommendations, the North Pacific Fishery Management Council amended Alaskan seabird avoidance measures for small longline vessels and for longline vessels fishing in inside waters, affecting over 600 Alaska longline vessels. Managers have also recognized the value of seabird distribution data to ecosystem-based fisheries management and adopted Sea Grant protocols on NOAA Fisheries cruises to assess West Coast groundfish and all Alaska stocks. Impact: Sea Grant research and outreach have led to adoption of science-based seabird bycatch mitigation strategies in Alaskan longline commercial fisheries and to research on mitigation techniques in fisheries worldwide. Techniques derived from this project could save at least 80,000 seabirds over the next 10 years in Alaskan waters alone. No endangered short-tailed albatross deaths have been observed in Alaska fisheries since 1998. *[A/FP-6 (end ebm)]*

221 ALASKA: Alaska Sea Grant identified disease as a possible factor in Steller's Eider, harlequin declines

Activity Summary: Multi-agency researchers characterized the occurrence and rate of disease and parasites among wintering sea ducks in Unalaska Bay. Threatened Steller's Eiders and harlequin ducks were the primary focus of the study. Researchers identified four viruses (adenovirus, reovirus, Newcastle disease virus, and influenza virus) and one fungal agent (Aspergillus spp.). An additional virus has been tentatively identified as a reovirus. Fourteen genera of bacteria were identified. Researchers also found other potential pathogens in 2007, including a Yersinia spp. in a Steller's eider, and evidence of intestinal helminths in both Steller's eiders and harlequin ducks. Impact Statement: The research enabled Alaska Sea Grant to play a vital role in helping to determine the probable cause of Steller's eiders and harlequin duck declines in Unalaska Bay. Results of this study will be used by the USFWS as it works with other state and federal agencies (DEC, EPA) to find solutions to the problems posed by disease in sea ducks. This project will be monitored to learn how it may affect policy and regulations aimed at addressing the disease problem. Project Level Impacts: Before this study began, exposure to disease was identified as a possible contributing factor to mortalities of Steller's eiders and harlequin ducks wintering near Dutch Harbor, Alaska. The findings of this project confirm that disease-causing organisms are present in sea ducks in Southwest Alaska. Scientists found that Steller's eiders and harlequin ducks in Unalaska Bay were more exposed to disease than were Steller's eiders and harlequin ducks in other wintering areas in Alaska. This finding suggests that such pathogens are being picked up within Unalaska Bay. Researchers believe an important source for E.coli may be untreated sewage or offal from fish processing outfall. Understanding the scale of disease occurrence will aid in understanding the effectiveness of future regulatory and policy actions by state and federal agencies. *[R/101-07 (unk end dis)]*

322 ALASKA: Alaska Sea Grant improved the capacity of federal and state ornithologists to gather accurate data on Alaska coastal bird nests, eggs, and birds

Activity: (Education Services) A U.S. Fish and Wildlife Service ornithologist collaborated with Alaska Sea Grant to publish the first-ever Field Guide to Bird Nests and Eggs of Alaska's Coastal Tundra; the second edition was published in 2008. Impact Statement: The guide improved the accuracy of field surveys required in environmental impact assessments and other coastal development survey and planning work. The author reports that this book has become the standard reference for USFWS and other biologists who do bird nesting studies in Alaska, including government and university scientists, conservationists, and industry, including BP environmental staff and oil industry consultants. The book is the primary reference used in the annual USFWS Yukon Delta nest survey, which was the major impetus for creating the book. Alaska Sea Grant distributed 260 copies of the book to the U.S. Fish and Wildlife Service, Yukon Delta Fisheries Development Association, Delta-Greely School District, Valdez City Schools, Barnes & Noble Booksellers, Alaska Geographic Association, Alaska Department of Fish and Game, Natural History Book Service, Wrangell Museum, and others. *[C/A/161-01 (end unk)]*

1131 CALIFORNIA: Black Abalone Restoration

Husbandry techniques are being developed so that black abalone, which is a candidate for listing, can be bred in captivity for “outplanting.” Project results have made significant changes in the perceived population dynamics of black abalone; in particular, the reproductive ecology of the species. As an endangered species under the federal ESA, restoration efforts will require a sufficiently thorough

understanding of the species' reproductive potential. Black abalone require dense spawning aggregations to ensure successful fertilization and limitations to reproductive success will further inhibit recovery. The discovery of reproductive limitations has therefore prompted additional research question concerning the mechanisms of this pattern. *[R/F-200 (end res)]*

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1219 CALIFORNIA: White Abalone Restoration

California Sea Grant researchers developed a genetic marker for positively identifying endangered white abalone. Experiments were conducted to test the efficacy of antibiotics in treating abalone disease. Husbandry techniques are being developed so that white abalone can be bred in captivity for "outplanting." The genetic marker was used to show that one of the "white abalone" collected for the recovery program, led by NOAA Fisheries, was in fact a pinto abalone. The marker will prevent inadvertent hybridization of white abalone. *[R/F-196 (dis end res)]*

248 TEXAS: Texas Sea Grant mobilizes volunteers to expand environmental education and habitat restoration (2009)

Six Coastal and Marine Resource (CMR) Agents identified, recruited and trained 86 interns through the Texas Master Naturalist (TMN) program. The TMN program's mission is to develop a corps of well-informed volunteers to provide education, outreach, and service dedicated to the beneficial management of natural resources and natural areas within their communities. Upon certification, these 86 interns joined a cadre of 508 master volunteers overseen by the CMR agents, contributed more than 54,000 hours of volunteer service, the equivalent of 26 full-time employees (GAO), whose time is valued at more than $1.1 million (independent sector). These Master Naturalists accounted for 36,334 educational contacts to students and teachers through in-school and after-school projects and trainings, and the general public through workshops on EarthKind Landscaping and rainwater harvesting. They also assisted in habitat restoration projects ranging from staking 7,000 recycled Christmas trees on the beach to help rebuild sand dunes, to planting more than 2,500 native marsh, wetland and prairie plants in wildlife refuges. Other projects included repairing state parks damaged by Hurricane Ike and conducting sea turtle patrols in order to locate and mark the nests of these endangered species. Advanced training for some included a 'Keys to Successful Presentations,'□ which taught the basics of public speaking to large audiences. Six of six (100%) reported they "probably will or definitely will" deliver public seminars as a result of the training. *[A/F-1 (train res end)]*